

Claims

[c1] We claim as our invention:

1. A method for assembling a shaft to a golf club head without epoxy, the golf club head having a hosel with a tapered bore, the shaft having a tip end and a butt end, the method comprising:
positioning the golf club head in a club head alignment device of an assembly apparatus, the assembly apparatus further including a holding device and a press device, the press device including a jaw mechanism;
placing a ferrule and a sleeve on the shaft proximate the tip end;
positioning the butt end of the shaft into the holding device of the assembly apparatus;
inserting a portion of the tip end of the shaft with the sleeve into the tapered bore of the hosel of the golf club head, a portion of the sleeve extending from the hosel;
enclosing the jaw mechanism of the press device around a portion of the shaft between the sleeve and the ferrule;
and
moving the press device to engage a top end of the sleeve and to force the sleeve further into the tapered bore of the hosel, whereby the shaft is at least partially

attached to the golf club head without epoxy.

- [c2] 2. The method according to claim 1, wherein the press device of the assembly apparatus includes a main member having a cavity formed therein, and further comprising placing a portion of the shaft including the ferrule within the cavity of the press device.
- [c3] 3. The method according to claim 1, further comprising aligning a graphic on the shaft with a face of the golf club head.
- [c4] 4. The method according to claim 3, wherein a laser alignment device is used to align the shaft with the golf club head, the laser alignment device being positioned on the assembly apparatus.
- [c5] 5. The method according to claim 1, further comprising: moving the press device away from the golf club head and disengaging the jaw mechanism; and removing the golf club head with the partially attached shaft from the assembly apparatus.
- [c6] 6. The method according to claim 5, further comprising securing the ferrule to the hosel.
- [c7] 7. The method according to claim 6, wherein securing the ferrule to the hosel includes engaging a threaded

portion of the ferrule with a threaded portion of the tapered bore of the hosel.

[c8] 8. The method according to claim 1, further comprising: placing a retention nut on the shaft proximate the tip end, the retention nut located between the ferrule and the sleeve;

moving the press device away from the golf club head and disengaging the jaw mechanism;

removing the golf club head with the partially attached shaft from the assembly apparatus; and

securing the retention nut in the tapered bore of the hosel.

[c9] 9. The method according to claim 8, wherein the press device of the assembly apparatus includes a main member having a cavity formed therein, and further comprising placing a portion of the shaft including the ferrule and the retention nut within the cavity of the press device.

[c10] 10. A method for assembling a shaft to a golf club head without epoxy, the golf club head having an interior hosel with a tapered bore therethrough, a crown opening and a sole opening, the shaft having a tip end and a butt end, the method comprising:
positioning the golf club head in a club head alignment

device of an assembly apparatus, the alignment device having a projection for placement in the sole opening of the interior hosel;

placing a ferrule and a sleeve on the shaft proximate the tip end;

positioning the butt end of the shaft into a holding device of the assembly apparatus, the holding device capable of oscillation;

placing a portion of the shaft including the ferrule into a cavity of a press device;

placing a portion of the tip end of the shaft and a portion of the sleeve through the crown opening and into the tapered bore of the interior hosel of the golf club head, a portion of the sleeve positioned outside of the crown opening;

aligning a graphic of the shaft with a face of the golf club head;

enclosing a jaw mechanism of the press device around a portion of the shaft between the sleeve and the ferrule;

moving the press device to engage a top end of the sleeve and press the sleeve into the tapered bore of the interior hosel of the golf club head to partially attach the shaft to the golf club head;

moving the press device away from the golf club head and disengaging the jaw mechanism;

removing the golf club head with the partially attached

shaft from the assembly apparatus; and
securing the ferrule to the interior hosel to completely
attach the shaft to the golf club head without epoxy.

[c11] 11. The method according to claim 10, further comprising:

placing a retention nut on the shaft proximate the tip
end, the retention nut located between the ferrule and
the sleeve;

placing the portion of the shaft including the ferrule and
the retention nut into the cavity of the press device; and
securing the retention nut in the tapered bore of the in-
terior hosel of the golf club head.

[c12] 12. The method according to claim 10, further comprising aligning the shaft with the golf club head through
use of a laser alignment device positioned on a lateral
arm of the assembly apparatus.

[c13] 13. An apparatus for assembling a shaft to a golf club
head, the golf club head having a hosel with a tapered
bore, the shaft having a tip end and a butt end and in-
cluding a ferrule and a sleeve disposed on the shaft
proximate the tip end, the apparatus comprising:
a first section;
a second section coupled to the first section;
a club head alignment device for receiving the golf club

head, the alignment device being disposed on the first section;

a holding device for receiving the butt end of the shaft, the holding device being disposed on the second section and being movable with respect to the club head alignment device; and

a press device disposed on the first section of the frame and including a jaw mechanism for enclosing a portion of the shaft between the sleeve and the retention nut, the press device being movable with respect to the club head alignment device to force the sleeve further into the tapered bore of the hosel.

[c14] 14. The apparatus according to claim 13, wherein the club head alignment device includes a projection for placement into a sole opening in the hosel of the golf club head.

[c15] 15. The apparatus according to claim 13, wherein the press device further includes a main member having a cavity formed therein for receiving a portion of the shaft including the ferrule.

[c16] 16. The apparatus according to claim 13, further comprising a laser alignment device for aligning the shaft with the golf club head.

[c17] 17. An apparatus for assembling a shaft to a golf club head without epoxy, the golf club head having an interior hosel with a tapered bore therethrough, a crown opening and a sole opening, the shaft having a tip end and a butt end, and a sleeve and a ferrule disposed on the shaft, the apparatus comprising:

- a frame having an upper section and a lower section;
- an alignment base disposed on the lower section of the frame, the alignment base having a projection for placement in the sole opening of the interior hosel;
- a holding device for receiving the butt end of the shaft, the holding device disposed on the upper section of the frame, the holding device capable of vertical oscillation;
- a press device disposed on the lower section of the frame, the press device capable of vertical oscillation, the press device having a cavity for receiving a portion the shaft with the ferrule; and
- a jaw mechanism connected to the press device, the jaw mechanism capable of enclosing the shaft above the sleeve and forcing the sleeve into the tapered bore of the interior hosel of the golf club head during oscillation of the press device.